

OUTLINE FOR PROPOSED CIA
EXTERNAL RESEARCH STUDY ON SOVIET RAILROADS

Introduction

There are a number of intelligence studies available to US intelligence agencies on over-all description of Soviet railroads, and a number of studies and intelligence documents containing detail on individual facilities along some railroad lines. By contrast, however, there is relatively little information available on the operating methods and procedures of Soviet railroads. While US libraries have a considerable number of books on this topic, they are all written in Russian which greatly reduces their availability to analysts involved in determining the capabilities and vulnerabilities of Soviet railroads, and Soviet intentions as revealed by activity on railroads. The sparseness of available information on this topic makes it difficult to assess incoming documents on weaknesses and strengths of Soviet railroads, and makes it difficult to interpret some of the information appearing in Soviet periodicals.

In this country are a number of former employees of the Soviet railroads, whose experience ranges from planning through repair and operating. It would be of great value to employ these defectors to write studies for which they are best qualified, each writer utilizing all available overt sources in this country in combination with his own experience. This study would then be coordinated by Transportation Branch (S/TR), CIA. Classified information might

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be combined with it by S/TR, or, to make the study useful to a wider range of intelligence users, it might be given a low classification, and have a separate appendix with a higher classification.

On the basis of the experience and ability of the individual, S/TR could issue each one an outline of the subject he is to cover. In some cases it might even be advisable to have two people studying the same topic, to fully utilize their capabilities, and also to provide a cross check. Coordination of duplications would be done by S/TR.

The purpose of these research studies is twofold: 1) To provide an integrated body of detailed information on Soviet railroad operation and administration, utilizing all available unclassified sources. It will include careful documentation of statements. Some of this information is available in spot translations from various books and periodicals; but these sources have never been exploited to provide a synthesized view on each subject. 2) To incorporate into the information described above the actual practice taken from the experiences of a group of men who worked on the Soviet railroads within the last 15 years. While unclassified publications will give a considerable amount of information, there is no way of knowing which information in publications is actually applied to practice. As an illustration of this in the US: In one case the Trenton yard was tied up almost completely because the train crews meticulously observed all rules pertaining to operation in

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yards. This demonstrates the fact that if all rules are observed to the letter, it is difficult or impossible to operate a railroad.

This study is subdivided into three sections or parts. The arrangement is intended to facilitate review and consideration of the study as an integrated whole, and has no relation to relative completion priorities desired on the various elements of it. These priorities are subject to recommendations later, not only from members of the intelligence community but from those actually working on the study, in the light of their special knowledge as to availability of material and relative importance of the various subjects in the functioning of the railroads as a whole.

The three subdivisions are:

Project I - The Administration of Soviet Railroads

II - The Operation of Soviet Railroads

III - Capacity of the Soviet Railroad System

Past and Present

Project I has to do with high-level administration and the formulation of railroad policy on broad general subjects of national importance. It would deal, for instance, with matters of organization on the ministerial and sub-ministerial level, down to and including the top man in the operating organization who is charged with responsibility for actually carrying into operation national policy as regards railroads. If applied to the British

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organization, for illustration, Project I would stop with the Chief Regional Officers.

Project II has to do with the methods and procedures by which transportation is actually performed in keeping with the policies determined from time to time as outlined under Project I. It would deal with the technical aspects of transportation as distinguished from the policy aspects. Organizational matters in this project would start with the USSR equivalents of the British Chief Regional Officers whose positions form the key link between policy and performance.

Project III is a specialized study of the capability of the USSR railroads in detail, which is the end result of policy plus technical performance. It would cover all those items which importantly affect the ability of the USSR railroads to meet the demands of national economic and military policy.

It is believed that these three projects, taken together (but not necessarily in relative order of priority according to arrangement of the outline, let it be repeated) will provide a comprehensive picture of hitherto unwritten and therefore unavailable aspects of Soviet railroad policy, planning and performance.

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Project I - The Administration of Soviet Railroads

I. Organization

- A. Chart showing the administrative structure of Ministry of Railways
- B. Description of each unit and its functions
- C. Description of related organizations in other ministries and their functions relative to railroads
- D. Relationship between the Communist Party and railroad administration
- E. Changes after World War II

II. Policy

A. Methods of arriving at policy

B. Policy toward

- 1. The position of railroad transportation in the Soviet economy
 - a. The relationship between railroads and production
 - b. The new location theory in its relationship to rail transportation.
 - c. Railroads in Soviet wartime economy
- 2. The place of railroads in Soviet transportation
 - a. Proportion and types of freight moving by rail
 - b. Passenger transport
 - c. Relationship between railroads and other forms of transportation
- 3. The expansion of
 - a. The network
 - b. Equipment
 - c. Labor supply

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4. Outlays and receipts

- a. Freight and passenger rate policy
- b. Depreciation and obsolescence

5. Railroad operation

- a. Centralization vs. local control
- b. Intensive use of facilities and labor
- c. Reduction of long and irrational hauls
- d. Setting up of reserves
- e. Use of local fuels
- f. Efficiency of operation and standards of service

III. Administration

- A. Chains of command to the operating level
- B. Comparison and contrast between administrative and operational chains of command
- C. Training and selection of administrators
- D. Coordination between management of different railroad systems; between railroads and other modes of transportation
- E. Legal and administrative regulations

IV. Planning

- A. Methods of setting up plans
- B. Relationship between planning and administrative groups

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Project II - The Operation of Soviet Railroads

I. Organization of railroad system

- A. Organizational chart
- B. Estimates of numbers of personnel in each function
- C. Relationship between operational and administrative chains of command
- D. Method of delimiting system boundaries and division boundaries; recent changes in boundaries and reasons therefore

II. Operating personnel

- A. Methods of recruitment
- B. Training
 - 1. Number and type of schools; location
 - 2. Programs
 - 3. Duration of study
 - 4. Number graduated annually
 - 5. Method of selection for training
 - 6. Political training
 - 7. On-the-job training
- C. Wages
 - 1. Average wage for each position
 - 2. Salary deductions and "voluntary" donations
 - 3. Overtime pay
 - 4. Rewards

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- D. Methods of assignment of personnel to specific areas
- E. Relative efficiency of railroad operating personnel
 - 1. Compared with operating personnel of other modes of transportation in USSR
 - 2. Compared with workers in other industries in USSR
 - 3. Compared with railroad operating personnel in US and Western Europe

III. Freight Loading and Unloading Operations

- A. Norms for amount and time of loading and unloading
- B. Type of personnel used
- C. Loading and unloading facilities and equipment (as cranes, fork-lift trucks)
- D. Preparation of waybills and other documentation and switching of cars for loading and unloading
- E. Transloading of freight between railroad lines of different gauges
- F. Transshipping of freight between railroads and other modes of transportation
- G. Problems in loading and unloading selected commodities, such as petroleum

IV. Freight Car Operations

- A. Allocation of freight cars by systems
- B. Ownership of freight cars by individual industries
- C. Allocation of cars to individual shippers; methods of allocation; priorities; procedures in time of car shortage
- D. Demurrage
- E. Turnaround time of freight cars; method of calculating turnaround time
- F. Average speed of freight car movement; factors retarding movement; methods of speeding movement

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- G. Tons per car; underloading and overloading
- H. Coefficient of freight car utilization
- I. Problems of movement in winter and in desert regions
- J. Freight car repairs and maintenance
 - 1. Running repairs and maintenance
 - a. Frequency of inspection enroute
 - b. Brake and air hose inspection and repair
 - c. Special inspection of tank cars; cleaning methods
 - d. Most frequent types of breakdowns
 - e. Frequency of hot boxes; frequency of axle box oiling and packing
 - f. Type and number of personnel involved in running repairs
 - g. Average car delays resulting from each type of repair
 - h. Facilities for making running repairs
 - 2. Classified repairs
 - a. Frequency of each type of repair - policy and practice
 - b. Procedures for classified repair
 - c. Work included in various classes of repair
 - d. Percentage of freight car park under repairs of different types
 - e. Efficiency of repair personnel
 - f. Effectiveness of repairs (must some cars be returned because repairs were made improperly?)
 - g. Sources of repair parts
 - h. Upgrading cars for grain harvest
- K. Special problems of refrigerator cars
 - 1. Methods of icing; location of icing stations

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2. Use of heaters
3. Empty back haul
4. Cleaning
5. Use of salt and effects of corrosion

- L. Use of guards, livestock attendants on individual cars
- M. Comparison of USSR and USA freight car operating methods
- N. Wagon reserves
- O. The system used for freight car numbering

V. Yard Operations

- A. Yard layout types (normal yards and transloading yards)
- B. Classification methods in yards of various types; use of hump , retarders, radios
- C. Number and type of switching locomotives assigned for yards of each type
- D. Number of personnel assigned
- E. Norms for yard operation
- F. Operation of transloading yards; special problems
- G. Methods of calculating capacities of yards (normal yards and transloading yards); capacities of selected yards

VI. Locomotive operations

- A. Selection of locomotive personnel; duties of each
- B. Number and type of personnel on locomotives
- C. Allocation of locomotives to individual systems and divisions, by type and number; use of diesels

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- D. Locomotive operating data
 - 1. Average mileage per locomotive day
 - 2. Fuel, electricity, or diesel fuel consumption per locomotive mile
 - 3. Water consumption per locomotive mile
 - 4. Coefficient of locomotive utilization
- E. Spacing of coal and fueling facilities
- F. Locomotive repair
 - 1. Running repair and maintenance
 - a. Responsibility for these repairs
 - b. Types of repairs made
 - c. Length of time for each type of repair
 - d. Running repair facilities
 - 2. Classified repairs
 - a. Mileage or time period between such repairs - policy and practice
 - b. Types of repairs under each class
 - c. Work included in various classes of repair
 - d. Length of time for each class
 - e. Source of repair parts
 - f. Repair facilities
 - g. Efficiency of repair personnel
 - h. Effectiveness of locomotive repairs
- G. Comparison between USSR and USA methods of locomotive operation
- H. Effects of winter and desert conditions on locomotive operation
- I. The system used for locomotive numbering

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VII. Train operations

- A. Train personnel - method of assignment, number, duties, length of runs, rest periods
- B. Train operation data
 - 1. Tons per train on various lines; for various types of locomotives; methods of deriving this figure; methods of increasing tonnage
 - 2. Norms for train operation
 - 3. Average train speeds (sectional, commercial, etc.); by lines; by various types of locomotives; methods of increasing speed
- C. Major causes of train delay
- D. Methods of dispatching trains; methods of compiling diagrams of train movement (train graphs)
- E. Methods of train control enroute; types of signals, signal indications
- F. Use of communications in train control
- G. Comparison between USSR and USA train operating methods
- H. Effects of winter and desert climates on train operation
- I. Special operating methods used for military movements during World War II
- J. Maximum possible frequency of trains on various lines

VIII. Construction and Maintenance of Roadway, Methods and Techniques

- A. Use of slave labor, military labor; its comparative efficiency
- B. Mechanization
- C. Establishment of construction and maintenance norms; Stakhanov's methods; speed of maintenance and construction

D. Sources of materials for

1. New lines
2. Electrification

E. Special techniques for reconstruction of lines

1. Bomb damaged
2. Other war damage

F. Problems of construction and maintenance

1. In winter
2. In desert regions
3. In permafrost areas
4. In peat bogs and quicksand areas

G. Use of imported materials

H. Temporary operation of railways under construction prior to incorporation in system

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Project III - The Capability of the Soviet Railroad System

A. Capability of the Freight Car Park

I. Inventory

- a. Total
- b. By type of car (box, flat, tank, etc.)
- c. By number of axles (2, 3, 4, more than 4)
- d. By capacity per car

2. Availability of the existing car park

- a. Proportion undergoing or awaiting repair
- b. Proportion in reserve
- c. Proportion in operation
- d. Freight car repair
 - (1) State of repair; frequency of freight car breakdowns, including hot boxes
 - (2) Length of time required for various classes of repair
 - (3) Frequency of various classes of repair
 - (4) Work included in various classes of repair

3. Utilization of operable car park

- a. Average time spent, and proportion of operable car park occupied at any one time, in
 - (1) Loading and unloading
 - (2) Yards, and switching between yards and loading points
 - (3) Movement on the line

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- b. Average speed
 - (1) Of movement on the line
 - (2) Of movement between origin and destination
 - (3) Turnaround time
- c. Demurrage
- d. Average movement per car per day — *distance moved average number of times in*
- e. Average length of haul of freight
- f. Ratio of empty to loaded car mileage
- g. Efficiency of freight car allocating methods
- 4. Regional temporary surpluses or deficiencies of cars
- 5. Retirement
 - a. Average retirement age in either mileage or years
 - b. Percentage retired annually
- B. Capability of the Locomotive Park
 - 1. Inventory
 - a. Total
 - b. By type of locomotive
 - c. By horsepower, tractive effort, or drawbar pull
 - d. By use (freight, passenger, yard)
 - 2. Availability of existing locomotive park
 - a. Proportion undergoing or awaiting repair
 - b. Proportion in reserve
 - c. Proportion in operation
 - 3. Utilization of operable locomotive park
 - a. Average time spent, and proportion of locomotives occupied in

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- (1) Freight and passenger locomotives (give separately)
 - (a) Standing in yards
 - (b) Servicing
 - (c) Movement on the line
 - (d) Delays enroute
- (2) Yard locomotives
 - (a) In servicing
 - (b) Delays and waiting
 - (c) Switching in yard
- b. Average speed of movement (sectional, etc.); average speed of movement between its termini
- c. Average daily run per operable locomotive (freight, passenger, yard)
- d. Average locomotive hours per day per operable locomotive (freight, passenger, yard)
4. Movement of locomotives from one division to another to meet temporary peaks of traffic
5. Retirement
 - a. Average retirement age in either mileage or years
 - b. Percentage of total park retired annually
6. State of repair; frequency of locomotive breakdowns
7. Locomotive repair
 - a. Length of time required for various classes of repair
 - b. Frequency of various classes of repair
 - c. Work included in various classes of repair

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8. Ratio of deadheaded locomotives to locomotives pulling trains; ratio of double headed (or pusher) trains to single headed trains
9. Capability of individual locomotive types
 - a. Maximum gross tonnage, on level track, for each type of locomotive
 - b. Maximum gross tonnage, for each type of locomotive on different degrees of grade and curve
 - c. Effect of dieselization and electrification on capacity of locomotives
10. Fuel and water
 - a. Fuel and water capacity of locomotives, by type
 - b. Average consumption of fuel and water per locomotive/km and per gross ton/km
 - c. Effect on fuel consumption of winter, grades, curves, etc.
 - d. Average, minimum and maximum spacing of fuel and water facilities; average, minimum and maximum capacity of these facilities; average, minimum and maximum time for replenishing fuel and water in tender

C. Capability of lines

1. Soviet methods of calculating line capacity
 - a. Assumptions underlying such calculations
 - b. Differences between single and double track lines
 - c. Short term and long term
2. Effect of Soviet track on line capability
 - a. Relationship between track and locomotive axle loading, and locomotive type used on lines

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- b. Relationship between track and train speed *and weight*
 - c. Effect of grades and curves on train speed and train spacing
 - d. Relationship between track and maximum permissible axle loading on freight cars
3. Effect of Soviet sidings on track capability
- a. Single vs. double track
 - b. Minimum, average, and maximum spacing of sidings
 - c. Minimum, average, and maximum length of sidings
 - d. Type of switches
4. Effect of Soviet signals on capability
- a. Type of signals
 - b. Location of signals (only at stations; or at both stations and along line)
 - c. Spacing of trains permissible with various types and spacings of signals (spacing given in both time and distance)
5. Effect of yards on line capability
- a. Time required to classify a train
 - b. Effect of various yard layouts on this time
 - c. Average and maximum daily car throughput in relationship to type and size of yard
 - d. Average delays in receiving and dispatching trains
6. Effect of bridges on line capability
- a. Normal permissible loading by types of bridges

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- b. Locomotive types which are excluded with each level of permissible loading
- c. Effect of bridges on train speeds and lengths
- 7. Effect of dispatching techniques
 - a. Single track lines
 - (1) Normal spacing of trains, in both distance and time
 - (2) Train delays in passing and in overtaking
 - (3) Average delays caused by train breakdowns, running of passenger or other superior trains
 - (4) Efficiency of dispatching technique
 - b. Double track lines (same headings)
 - c. Dispatching with electrified or dieselized lines
- 8. Effect of grades and curves on train capability (see section under locomotive tonnage ratings)
- 9. Minimum essential passenger traffic, compared with existing passenger train scheduling
- 10. Lines presently operating at full capability

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OUTLINE FOR PROPOSED CIA EXTERNAL RESEARCH STUDY ON
CASPIAN SEA MERCHANT SHIPPING

Summary and Conclusions: General summary of paper, and intelligence conclusions that can be derived from study of Caspian Sea traffic

- I. Introduction: Importance of Caspian Sea traffic to Soviet Bloc economic capabilities and potential
- II. Caspian Sea Merchant Fleet
 - A. Organization: administration, operating T/O, etc.
 - B. Size and quality
 1. Tanker fleet
 - a. Size: data on number, draft, length, capacity, other statistics and descriptive data, including home port
 - b. Quality: appraisal of quality from analysis of above data
 2. Freighter fleet: data as in B.1.a. and b.
 3. Fishing fleet: as in B.1.a. and b.
 - C. Fleet Repair and Maintenance: facilities, locations, problems and policies. Importance of repair and maintenance work in contrast to new construction
 - D. Labor Force
 1. Number, by types of skills
 2. Quality (training and experience) by types of skills
 3. Labor problems: turnover, recruiting, education, etc.

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III. Caspian Sea Ports: names, locations, cargo handling facilities, volume and nature of traffic, transshipping operations, clearance capacities, advantages, weaknesses (weather, lowering water level, dredging, etc.)

IV. Caspian Sea Merchant Shipping Operations

A. Volume and nature of traffic

1. Volume: how much, where from/to, how moved, when
2. Nature: what kind, where from/to, how handled, seasonality
3. Significance of Volga-Don Canal to Caspian Sea operations

B. Probable trends: analysis of possible shifts in all aspects discussed in IV.A.2. and 3.

V. Significance of Caspian Sea Traffic to the economy of the USSR: how and why is it important, in peace and war; possible trends

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